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Methane production and its sources in a reservoir located in monsoon climate region

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The role played by reservoirs in the green house gas emission is a subject of ongoing debate. Recently research has revealed that reservoirs emit significant levels of greenhouse gases (CO_2 and CH4). To assess the importance of reservoirs as a source of methane gas into the atmosphere, we investigated variation in organic carbon (OC) input (as focusing on coarse material e.g. woody debris) into the reservoir, oxic condition changes, and looked into the amount of methane emitted in an ebullition pathway in Lake Soyang, which is located in forested area and the largest reservoir in South Korea.
Total organic carbon (TOC) concentrations were higher during summer after heavy rainfall in monsoon season. The TOC consisted with mostly coarse particulate organic carbon (CPOC) indicating that CPOC is the main carbon source to the reservoir system. During stratification, oxygen depletion occurred in the hypolimnion due to the decomposition of organic matter. Under these conditions, methane can be released from sediment. The methane emissions from the reservoir were much higher than from other natural lakes. However, the temporal and spatial variations of methane ebullition were huge, and were clearly dependent on many factors. Therefore, more research via well-organized field campaign is needed to investigate methane emissions.